

Interactive comment on “Transport of Asian trace gases via eddy shedding from the Asian summer monsoon anticyclone and associated impacts on ozone heating rates” by Suvarna Fadnavis et al.

Anonymous Referee #3

Received and published: 10 April 2018

Review ACPD paper (Fadnavis et al. 2018): “Transport of Asian trace gases via eddy shedding from the Asian summer monsoon anticyclone and associated impacts on ozone heating rates”

Fadnavis et al. studies the eddy shedding aerosol by ASM in UTLS. The study shows eddy shedding from the monsoon is more frequent over west-Africa vs. West-Pacific. The lag is about 3-6 days from the center of ASM to Africa and Pacific. I found this study is interesting, however I suggest major revisions before publication. Especially the causes of the ozone anomaly near the tropopause due to emission change is unclear, and this is important to understand the ozone heating rates, which is the major

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conclusions of the study.

Regarding Section 4.3:

The authors did sensitivity experiment by reduce surface emissions of NOx and NMVOCs. Figure 8 and text (Section 4.3). The anomalies of chemical tracers in UTLS region are very interesting. PAN shows an extended negative anomaly in LS, which indicates cross-tropopause transport. Can you show figure 8 (e-h) for all longitudes?

I am still confused with the high anomaly of O3 near the tropopause shown inn Figure 8 (i-l). The discussions in the paper (Line 306-320) are rather vague. What causes the ozone positive anomaly in LS?

Put model data significance (e.g. dots) on top of the plots (e.g. Figure 8).

If the LS anomaly is real and significant, I guess you should be able to see better from inert tracers e.g. CO. Please add CO plots in Figure 8 as well.

Your conclusions/findings on ozone heating rate (Section 4.4) requires your understanding and clarification of the ozone anomaly.

Regarding MIPAS:

Following the other reviewer, pls correct/improve MIPAS data display.

Regarding Section 3.2:

Please explain details of power spectrum

Regarding Model:

You define center of ASM as 85-90E, any reason you pick the 5-deg longitude within the ASM (80-120E)?

Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2018-168>, 2018.

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